Full Text PA-93-068

THE HUMAN BRAIN PROJECT: PHASE I FEASIBILITY STUDIES

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National Center for Research Resources
National Library of Medicine
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National Aeronautics and Space Administration

Letter of Intent Receipt Date: April 19, 1993
Application Receipt Date: June 15, 1993

PURPOSE

The Human Brain Project is a broadly based federal research initiative, supported by the National Institute of Mental Health (NIMH), the National Institute on Drug Abuse (NIDA), the National Science Foundation (NSF), the National Institute of Child Health and Human Development (NICHD), the National Institute on Aging (NIA), the National Institute on Deafness and Other Communication Disorders (NIDCD), the National Center for Research Resources (NCRR), the National Library of Medicine (NLM), and the Office of Naval Research (ONR). In addition, the National Aeronautics and Space Administration (NASA) will make available to Human Brain Project research its supercomputer and other resources of the Biocomputation Center.

The general purpose of this initiative is to encourage and support investigator-initiated basic and clinical neuroscience research and investigator-initiated research on informatics resources that could be used to facilitate neuroscience research. Particular emphasis is placed on research on computer storage and manipulation of neuroscience information, network systems, and associated tools that will give neuroscientists access to the stored information. The networks will also provide electronic channels of communication and collaboration to geographically distant laboratories. Emphasis will also be placed on collaborations that result in new experimental technologies or new mathematical paradigms linked to empirical research. To optimize the utility of these technologies to neuroscience researchers, they will be developed in the context of specific neuroscience research. It is important to emphasize that the scientific question being addressed is as important as the technology being developed.

Neuroscience is a vigorous, multidisciplinary field that has grown tremendously in the last two decades. This progress has, to a large extent, been fueled by information from many disciplines and across many levels of neural organization. An explosion of information at

each of these levels, from gene to behavior, makes it increasingly difficult for individual neuroscientists to keep up with developments in their own circumscribed areas of interest. It is more difficult still for investigators to relate their findings to an integrated understanding of the nervous system. Yet it is precisely such integration that is necessary for the generation of meaningful hypotheses and continued rapid scientific progress.

Limitations in the ability of scientists to manage and integrate information are forcing a return to the fragmented view of neuroscience that existed 30 years ago. Fortunately, computer, information, and telecommunication sciences offer solutions to this problem. The Human Brain Project will research these informatics solutions in the context of neuroscience research projects. Human Brain Project research will thus augment the ability of neuroscientists to integrate and synthesize information across disciplinary and geographic boundaries.

In 1989, NIMH, NIDA and NSF requested the National Academy of Science's Institute of Medicine (IOM) to establish a Committee on a National Neural Circuitry Database. The Committee's charge was to consider the desirability, feasibility, and possible ways of implementing a family of resources, both electronic (e.g., computer networks) and digital (e.g., databases), for the enhancement of neuroscience research. After deliberations spanning almost two years and involving more than 150 scientific consultants, the IOM endorsed the concept of mapping the brain and its functions and issued several specific recommendations (Mapping the Brain and Its Functions: Integrating Enabling Technologies into Neuroscience Research, 1991, Institute of Medicine, National Academy Press).

Among these recommendations is that this initiative should be implemented in several phases by the research community. Phase I will consist of research feasibility studies that researchers will then refine and extend in Phase II. The participating agencies, institutes and center are requesting research grant applications for Phase I of the Human Brain Project. This ongoing program announcement pertains only to Phase I activities.

HEALTHY PEOPLE 2000

The Public Health Service (PHS) is committed to achieving the health promotion and disease prevention objectives of Healthy People 2000, a PHS-led national activity for setting priority areas. This program announcement, The Human Brain Project: Phase I Feasibility Studies, is related to the priority area of mental health and mental disorders. Potential applicants may obtain a copy of "Healthy People 2000" (Full Report: Stock No. 017-001-00474-0) or "Healthy People 2000" (Summary Report: Stock No. 017-001-00473-1) through the Superintendent of Documents, Government Printing Office, Washington, DC 20402-9325 (telephone 202-783-3228).

ELIGIBILITY REQUIREMENTS

Applications may be submitted by domestic and foreign, public and private, non-profit and for-profit organizations such as universities, colleges, hospitals, laboratories, units of State and local governments, and eligible agencies of the Federal government. Women and minority investigators are encouraged to apply.

MECHANISMS OF SUPPORT

Anticipated maximum annual budgets (direct and indirect costs) at time of award are $230,000 for the R01 mechanism and $1.1 million for the P20 mechanism. Support may be requested for a period of up to five

years for R01 and P20 grant mechanisms (foreign grants are limited to three years duration).

It is estimated that approximately $4 to 5 million will be available to support new grants under this announcement in fiscal year 1993. The exact amount of funding available will depend on appropriated funds, the quality of applications, and program priorities at the time of award.

This program will use research project grant (R01) and Exploratory Grant (P20) mechanisms. Listed below are opportunities and requirements which differ between these grant mechanisms:

Research Project Grants (R01). The R01 mechanism will be used for research project grants, which will allow investigators to work on highly focused projects related to the integration of neuroscience and informatics research. The R01 mechanism can be used for collaborative research initiation grants that will be directed towards fostering the interactions of computer and mathematical scientists or engineers and neuroscientists to design and implement novel technological solutions to particular neuroscience questions. Applications may include support for expenses for travel and per diem expenses to several laboratories to initiate or to explore the possibility of setting up a collaboration. It is essential that the scientific questions to be pursued and the unique contribution of each potential group member should be explicitly stated.

Exploratory Grants (P20). These awards will provide the opportunity for several investigators using different approaches to focus on a common problem. Exploratory Grants (P20) will facilitate coordinated communication across disciplinary and geographic boundaries.

o Director. Each Exploratory Grant (P20) will have a Director with a demonstrated ability to organize, administer, and direct the grant. The Director must commit at least 25 percent effort to the grant and be Principal Investigator on one of the projects.

o Focus of research. The Exploratory Grants (P20) will combine informatics and neuroscience research components in an effort to develop novel approaches for managing and distributing neuroscience information. Each Exploratory Grant (P20) will focus on a specific research issue in neuroscience and will include investigations at several levels of neural organization (e.g., molecular, cellular, and systems levels) and/or using different methodological approaches (e.g., electrophysiological, anatomical and behavioral), thereby facilitating the integration of different types of neuroscience information.

Exploratory Grants (P20) are characterized by the synergy of their constituent projects. Each such grant application must, therefore, not only demonstrate the interrelationship of its constituent projects but also indicate how the inclusion of each project will enhance the overall goals of the grant.

o Group members. Each Exploratory Grant (P20) will comprise several, probably from three to five, laboratories or projects. It is expected that the Principal Investigators of the constituent laboratories or projects will be regarded as leaders in their respective fields.

o Information sharing. In research funded by this mechanism, digital and electronic communication, especially via computer networks, will be established among different laboratories or projects within a given Exploratory Grant (P20) group. An important goal of each Exploratory Grant (P20) will be to develop the technology that will allow databases and computer network systems to handle and integrate data generated by

all of the laboratories or projects supported by that grant.

Communication among different Exploratory Grant (P20) groups will promote the compatibility of the various technologies developed by each group. Therefore, digital communication, especially via computer networks, will be encouraged among different such groups. Investigators working on problems at the same level of neural organization, or using the same methodologies, are prime candidates for such interaction. Additionally, because of the pivotal role that computer networks will play in this initiative, laboratories participating in a given Exploratory Grant (P20) group need not all be at the same geographic location.

RESEARCH OBJECTIVES

Phase I of the Human Brain Project will support the research related to the development, storage, management, analysis, integration and dissemination of neuroscience information. This initiative will incorporate cutting-edge informatics research with neuroscience research in order to facilitate the integration of neuroscience information and to promote communication and collaboration across scientific disciplines and geographic locations.

Consistent with the goal to integrate neuroscience information, the Human Brain Project research will lead to three-dimensional computerized maps and models of the structures, functions, connectivity, physiology, pharmacology, biochemistry, and molecular biology of human, monkey, and rat brains. Other mammalian, as well as nonmammalian vertebrate and invertebrate species, are also appropriate for study. It is expected that these maps and models will ultimately: span different developmental stages of organisms; reflect both normal and disease states; include numeric, textual, graphic, and image data; and be available via computer networks.

Broad research objectives appropriate to the Human Brain Project include, but are not limited to, the following:

o Storage and manipulation of neuroanatomical, neurochemical, neurophysiological, and other data that are portable at the source code, user interface, and platform levels

o Network transmission of neuroscience data at varying levels of confidentiality

o Ways to integrate neuroanatomical data, neurochemical data, neurophysiological data, and behavioral data

o Approaches that permit access to and integration of information related to different areas of neuroscience (e.g., molecular biology, electrophysiology, and behavior)

o Visualization of data related to the structure and function of the nervous system

o Approaches for the intelligent navigation through a range of types of neuroscience information in heterogeneous environments over networks

o Probabilistic, population-based anatomic atlases of brain images of normal subjects matched for handedness, age, and gender.

o Approaches for the analysis of intersubject variability of structural and functional image data for circumscribed subject populations

o Approaches for compression of neuroimaging data

o Shared data resources and repositories for neuroscience data generated by the Human Brain Project

o Ways to provide interactions between the Human Brain Project neuroscience information and pertinent national informational resources, such as those associated with the Human Genome Project

o Approaches for electronic collaboration of neuroscientists

o Assessment of behavior and ontogenetic brain changes in infants, children, and adolescents, particularly in populations at risk for consequently developing specific medical or behavioral disorders

o Analysis and display techniques for optimizing functional brain imaging by integrating images from several modalities, e.g., EEG, MRI, PET, functional MRI

o Ways to use neurobiologically realistic information and algorithms to guide implementation of Very Large Scale Integrated chip technologies

o Use of intelligent control or neuroengineering paradigms to explain neurobiological results

o Interactive graphics systems to facilitate real-time imaging

o Approaches to allow interaction with stored neurobiological information to provide biological constraints on computational models

o Qualitatively new types of biological sensors and sensor data processing systems

o Massively parallel virtual supercomputing based on networks of small computers in multiple geographic locations to facilitate modeling of information processing in neurobiological systems.

o Ways to interface humans with computers

o Computerized search strategies for stored neuroscience information

This list of broad objectives is meant to be illustrative and is not exclusive of other objectives appropriate to Phase I of this initiative.

The Human Brain Project encourages informatics research carried out in concert with neuroscience research. This initiative will provide support either for an informatics component that is carried out with ongoing peer-reviewed neuroscience research or for both the informatics and the neuroscience components. In the former case, the funding of the neuroscience component may come from any source.

Each project will be accountable for the attainment of proposed specific aims through progress reports and the timely publication and dissemination of results, including software, database designs, and source codes.

Phase I projects will be investigator-initiated and can use the R01 or P20 mechanism, explained below.

As Phase I evolves, digital and electronic communication among projects will be supported. Supplemental funds may be competitively awarded to projects to support such interactions after they have been in existence

for 3 years and have demonstrated the requisite capabilities within their own projects.

A listing of investigators participating in Phase I, and the types of data, software, or other information that is available from or through them will be created to minimize scientifically unnecessary duplication of effort in Phase I. This list will indicate from whom particular data might be obtained. Grantees will be invited to contribute to this list and to participate in semiannual meetings of Human Brain Project investigators. These meetings will promote communication among different groups of investigators.

Availability of Computational Resources

The choice of computational resources to be used in Human Brain Project research is entirely that of the applicant, and the range of appropriate resources extends across the entire spectrum of computer technology. Nevertheless, some investigators may be interested in using, or collaborating with those using, supercomputers, massively parallel computers, and other advanced technology that may not be available at their institution. To facilitate such use and collaboration, the following information is provided.

o The NSF supports High Performance Computer Centers and Science and Technology Centers. Individuals considering applications for supercomputer use should contact these centers early in the proposal development process.

Linda Callahan
Cornell Theory Center
514 Engineering and Theory Center Building
Ithaca, NY 14853-3801
Telephone: (607) 254-8610
Internet: cal@theory.tc.cornell.edu
Bitnet: cal@CRNLTHRY

National Center for Atmospheric Research, Scientific Computing Division
Visitor/User Information
P.O. Box 3000
Boulder, CO 80307
Telephone: (303) 497-1225
Internet: scdinfo@ncar.ucar.edu
Bitnet: scdinfo@ncario

Scott Lathrop
National Center for Supercomputing Applications
605 East Springfield Avenue
Champaign, IL 61820-5518
Telephone: (217) 244-1099
Internet: slathrop@ncsa.uiuc.edu
Bitnet: ul3006@ncsagate

Robert B. Stock
Pittsburgh Supercomputing Center
4400 Fifth Avenue
Pittsburgh, PA 15213
Telephone: (412) 268-4960
Internet: stock@psc.edu
Bitnet: stock@cpwpsca

Mark Sheddon
San Diego Supercomputer Center
P.O. Box 85608
San Diego, CA 92186-9784

Telephone: (619) 534-5130
Internet: sheddon@sdse.edu
Bitnet: sheddon@sdsc

o The ONR also supports a variety of supercomputer facilities. Those interested in these resources for Human Brain Project Research should contact the ONR contact listed at the end of this announcement early in the process of application development.

o In addition, NASA will make available computational resources of the Biocomputation Center (BC) at Ames Research Center, Moffett Field, California. These resources include computer-controlled transmission electron microscopy for semiautomated 3 dimensional reconstruction of neural tissue, virtual environments, high-performance workstations, supercomputers, and massively parallel computers.

A scientist interested in using the BC as part of Human Brain Project research will submit a written request for facility use to the BC Director prior to submitting an application to the Public Health Service. This request will state the objectives of the intended work and the approaches to be used. This request will also provide enough information to allow BC staff to assess whether or not the intended use is within the capability of the BC. In addition, this request will provide information necessary to allow BC staff to determine the amount of time the proposed work will require.

On review of the request for BC use, the BC staff will provide the inquiring scientist with an itemized estimate of the costs for BC resources needed to achieve the stated objectives. The scientist will use this estimate as part of the budget justification in the Public Health Service application for funds to support the Human Brain Project research.

Requests for BC use are to be sent to:

Dr. Muriel Ross
Director, Biocomputation Center
MS 261-2
Ames Research Center
Moffett Field, CA 94035-1000

STUDY POPULATIONS

SPECIAL INSTRUCTIONS TO APPLICANTS REGARDING IMPLEMENTATION OF NIH POLICIES CONCERNING INCLUSION OF WOMEN AND MINORITIES IN CLINICAL RESEARCH STUDY POPULATIONS

Applications for grants that involve human subjects are required to include minorities and both genders in study populations so that research findings can be of benefit to all persons at risk of the disease, disorder or condition under study; special emphasis should be placed on the need for inclusion of minorities and women in studies of diseases, disorders and conditions which disproportionately affect them. This policy applies to all research involving human subjects and human materials, and applies to males and females of all ages. If one gender and/or minorities are excluded or are inadequately represented in this research, particularly in proposed population-based studies, a clear compelling rationale for exclusion or inadequate representation should be provided. The composition of the proposed study population must be described in terms of gender and racial/ethnic group, together with a rationale for its choice. In addition, gender and racial/ethnic issues should be addressed in developing a research design and sample size appropriate for the scientific objectives of the study.

Applicants are urged to assess carefully the feasibility of including the broadest possible representation of minority groups. However, it is recognized that it may not be feasible or appropriate in all research projects to include representation of the full array of United States racial/ethnic minority populations (i.e., American Indians or Alaskans Natives, Asians or Pacific Islanders, Blacks and Hispanics). Investigators must provide the rationale for studies on single minority population groups.

Applications for support of research involving human subjects must employ a study design with minority and/or gender representation (by age distribution, risk factors, incidence/prevalence, etc.) appropriate to the scientific objectives of the research. It is not an automatic requirement for the study design to provide statistical power to answer the questions posed for men and women and racial/ethnic groups separately; however, whenever there are scientific reasons to anticipate differences between men and women, and racial/ethnic groups, with regard to the hypothesis under investigation, applicants should include an evaluation of these gender and minority group differences in the proposed study. If adequate inclusion of one gender and/or minorities is impossible or inappropriate with respect to the purpose of the research, because of the health of the subjects, or other reasons, or if in the only study population available, there is a disproportionate representation of one gender or minority/majority group, the rationale for the study population must be well explained and justified.

The funding components will not make awards of grants, cooperative agreements or contracts that do not comply with this policy. For research awards which are covered by this policy, awardees will report annually on enrollment of women and men, and on the race and ethnicity of subjects.

Protection of Human Subjects

The Department of Health and Human Services has regulations for the protection of human subjects and has developed additional regulations for the protection of children. A copy of these regulations (45 CFR 46, Protection of Human Subjects) and those pertaining specifically to children are available from the Office of Protection from Research Risks, National Institutes of Health, Bethesda, Maryland 20892, telephone (301) 496-7041. Specific questions concerning protection of human subjects in research may be directed to NIMH staff listed under INQUIRIES.

LETTER OF INTENT

It may be beneficial for applicants to contact the appropriate program official(s) listed below and submit a letter of intent. The letter should include a descriptive title of the proposed research, the name, address, and telephone number of the Principal Investigator (or Director), names of other key personnel, and participating institutions.

Although a letter of intent is not required, is not binding, and does not enter into the review of subsequent applications, the information that it contains is helpful in planning for the review of applications. The letter is to be submitted to Dr. Michael F. Huerta at the address listed under Inquiries. Each letter of intent will be distributed to all of the sponsoring agencies, institutes and center.

APPLICATION PROCEDURES

Applicants are to use the grant application form PHS 398 (rev. 9/91).

The number and title of the program announcement, "PA-93-068 THE HUMAN BRAIN PROJECT: PHASE I" must be typed in item number 2a on the face page of the PHS 398 application form. The mechanism, either R01 or P20, must be typed in item 2b on the face page of the PHS 398 application form. When applicable, consultant/collaborator information should be provided in section 7, and consortium/contractual arrangements should be provided in section 8 of the PHS 398 application form. This form may be obtained from business offices or offices of sponsored research at most universities, colleges, medical schools, and other major research facilities; from the Office of Grants Inquiries, Division of Research Grants, National Institutes of Health, Westwood Building, Room 449, Bethesda, MD, telephone 301/594-7248; and from the program officials listed under INQUIRIES. Applications must be received by June 15, 1993.

Research Project Grants (R01). For the R01 mechanism, applicants must follow the instructions provided in grant application form PHS 398 (rev. 9/91).

Exploratory Grants (P20). The application must describe the specific research hypotheses to be tested and how they relate to the overall research issue addressed by the grant. In addition, the application should clearly articulate the manner in which technological components relate to neuroscience components. For the Exploratory Grant (P20) applications only, the Research Plan Section of form PHS 398 (Specific Aims, Background and Significance, Progress Report/Preliminary Studies, and Research Design and Methods) should be replaced by the following.

o General Description of the Overall Project (Not to exceed 10 pages). The applicant must provide an overview of the overall proposed project and its central theme and goals, describe the general objectives, and explain the proposed contribution of each of the individual projects and cores in achieving these objectives. Furthermore, the administrative arrangements and support necessary to effect the research should be carefully described in the application. In particular, when multiple institutional sites are involved, a detailed description and supporting documentation for the administrative arrangements should be included. Detailed information on collaborations, recruitment, facilities, and resources should also be provided.

o Cores (Not to exceed 5 pages for any one core). The applicant must describe how each core will contribute to the goals of the overall project as well as how each individual project will draw upon a particular core. The description of each core should clearly indicate the facilities, resources, services and professional skills that the facility will provide.

o Individual Projects (Not to exceed 15 pages for any one project). The applicant must describe the major objectives and goals of each individual project and its relationship to the effort of the entire group of constituent projects. In addition, detailed descriptions should be provided on the following:

o Research Plan: The questions to be addressed and the hypotheses to be tested by the proposed research should be highly focused and fully explained. Full discussion is required on the status of current research efforts, the limitations of existing approaches, and how the research questions posed relate to the objectives of the Human Brain Project. In addition, the relationship between the neuroscience and the technological components should be made explicit.

o Experimental Plan: The description of the experimental design should provide the specific strategies proposed to accomplish the

specific aims of the project and should include a discussion of the innovative aspects of the approach. Nevertheless, the experimental procedures need not be spelled out in great detail if those procedures have already been extensively published and accepted by the scientific community. New methodology and its advantage over existing methodologies should, however, be fully described. Furthermore, the feasibility of the proposed experiments, the potential pitfalls, alternative approaches, and relevance to the goals of the project as a whole should be fully discussed. The methods to be used should be cited and referenced. It should be emphasized that these reduced requirements necessitate the inclusion of investigators that are considered to be leaders in their fields.

o Operational Plan: A description of the resources and working arrangements required to implement the research plan should be fully elaborated. If a project includes a clinical component, attention should be devoted to a description of the clinical populations, tissue resources, etc. A distinction must be made between those resources that are already in place (including staff) and those resources which must be added to carry out the proposed research.

The signed original and five legible copies of the completed application must be sent to:

Division of Research Grants
National Institutes of Health
Westwood Building, Room 240
Bethesda, MD 20892**

Dates for the submission of Phase I Human Brain Project applications for Fiscal Year 1993 and review cycles are:

Letter of Intent Receipt Date:	April 19, 1993
Application Receipt Date:	June 15, 1993
Administrative Review:	June 1993
Scientific Review:	July/August 1993
Advisory Council Review:	September 1993
Earliest Starting Date:	September 1993

In subsequent years, the dates for the submission of Phase I Human Brain Project applications and review cycles will be:

Letter of Intent Receipt Date:	July 1
Application Receipt Date:	October 15
Administrative Review:	October
Scientific Review:	February/March
Advisory Council Review:	May/June
Earliest Starting Date:	July

REVIEW CONSIDERATIONS

Applications will be assigned to the appropriate agencies, institutes and centers according to their goals and designs and in accordance with standard referral guidelines. Those deemed by the Division of Research Grants to be appropriate for this program announcement will be reviewed for scientific and technical merit by a special review committee (SRC) composed primarily of non-Federal scientists. The members of this committee will be determined by the participating agencies, institutes, and centers. Summaries of SRC recommendations will be sent to applicants as soon as possible after the meeting of the SRC. Subsequent processing of the application will follow the procedures of the respective agency, institute and/or center to which it has been assigned. For applications assigned to a Public Health Service (PHS) institute or center, the application will receive further review by the

appropriate National Advisory Council. By law, only projects recommended for approval by Council may be considered for PHS funding. All successful projects will be identified as "A Unit of the NIH/NSF/ONR/NASA Human Brain Project."

Criteria for review of applications will include the following:

o Scientific, technical, or medical significance and originality of proposed research

o Appropriateness and adequacy of the experimental approach and methodology proposed to carry out the research

o Qualifications and research experience of the Principal Investigator and staff, particularly but not exclusively in the area of the proposed research

o Availability of resources necessary to perform the research

o Appropriateness of the proposed budget and duration in relation to the proposed research

o Likelihood that the work will lead to significant integration of informatics and neuroscience research, to new discoveries, and/or to new technological developments

o Feasibility and adequacy of the organizational and administrative plans

o Mechanisms to evaluate the progress of the project

o Adequacy of the project's plans for the protection of human and animal subjects

AWARD CRITERIA

Criteria for grant awards include the following:

o Intrinsic interest of the neuroscience problem

o Scientific merit of the proposed research

o Responsiveness to the objectives outlined in this announcement and relevance of the research to the mission of the Human Brain Project

o Availability of research funds and competing demands of other research funding requirements

Annual awards will be made subject to continued availability of funds and progress achieved. A competing supplemental application may be submitted during an approved period of support to expand the scope of a project during the approved period. A competing continuation (i.e., renewal) application may be submitted before the end of an approved period of support to continue a project.

INQUIRIES

The following representatives from each of the participating agencies, institutes and center can be contacted for further information or clarification. Potential applicants are strongly encouraged to contact the agency or institute representative to discuss their plans prior to preparing an application.

Michael F. Huerta, Ph.D.

National Institute of Mental Health
5600 Fishers Lane, Room 11-95
Rockville, MD 20857
Telephone: (301) 443-3948
FAX: (301) 443-4822
E-mail: HMI@CU.NIH.GOV

Christine R. Hartel, Ph.D.
National Institute on Drug Abuse
5600 Fishers Lane, Room 10A-31
Rockville, MD 20857
Telephone: (301) 443-1887
FAX: (301) 227-6043
E-mail: CHARTEL@AOADA.SSW.DHHS.GOV

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National Science Foundation
1800 G Street, NW, Room 321
Washington, DC 20550
Telephone: (202) 357-7041
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E-mail: CMLEONAR@NSF.GOV

Deborah Claman, Ph.D.
National Institute on Aging
Gateway Building, Room 3C307
7201 Wisconsin Avenue
Bethesda, MD 20872
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National Institute of Child Health and Human Development
6100 Building, Room 4B05
Bethesda, MD 20892
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FAX: (301) 402-2085

Judith Cooper, Ph.D.
National Institute on Deafness and Other Communication Disorders
Executive Plaza South, Room 400B
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Telephone: (301) 496-5061
FAX: (301) 402-6251

Charles L. Coulter, Ph.D.
National Center for Research Resources
Westwood Building, Room 8A15
Bethesda, MD 20892
Telephone: (301) 594-7934
FAX: (301) 594-9187
E-mail: CCO@CU.NIH.GOV

Peter A. Clepper
National Library of Medicine
Building 38A, Room 5S518
Bethesda, MD 20894
Telephone: (301) 496-4221
FAX: (301) 402-0421
E-mail: CLEPPER@NLM.NIH.GOV

Terry Allard, Ph.D.

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800 N. Quincy Street, Room 1142
Arlington, VA 22217-5660
Telephone: (703) 696-4502
FAX: (703) 696-1212
E-mail: TERRY@TOMCAT.ONR.NAVY.MIL

Frank M. Sulzman, Ph.D.
National Aeronautics and Space Administration
Code SBM, NASA Headquarters
Washington, DC 20546
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FAX: (202) 358-4168
E-mail: FSULZMAN@SMTPGMGW.OSSA.HQ.NASA.GOV

Direct inquiries regarding fiscal matters to:

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Shirley Denney
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Jean Feldman, Policy Officer
Division of Grants and Contracts Policy Office
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Joseph Ellis
Office of Extramural Affairs
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Doug Shawver
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National Institute of Child Health and Human Development
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Telephone: (301) 496-1303

Sharon Hunt
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National Institute on Deafness and Other Communication Disorders
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Telephone: (301) 402-0909

Paul Karadbil
Office of Grants and Contracts Management
National Center for Research Resources
Westwood Building, Room 849

5333 Westbard Avenue
Bethesda, MD 20892
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Shelly Carow
Office of Extramural Programs
National Library Medicine
Building 38A, Room 5N517
Bethesda, MD 20894
Telephone: (301) 496-4195

Willard Vaughan, Ph.D.
Cognitive and Neural Sciences Division
Office of Naval Research
800 N. Quincy Street, Room 823
Arlington, VA 22217-5660
Telephone: (703) 696-4505

The National Institute of Neurological Disorders and Stroke (NINDS) and the National Eye Institute (NEI), while not cosponsors of this Program Announcement, have continuing interest in the scientific areas related to the Human Brain Project. NINDS and NEI will continue to fund research on these topics through applications received through the regular receipt and referral processes of the Division of Research Grants. Applicants should contact the relevant NINDS or NEI program staff for further information.

AUTHORITY AND REGULATIONS

This program is described in the Catalogue of Federal Domestic Assistance Nos. 93.242 (NIMH), 93.279 (NIDA), 47.074 (NSF), 93.866 (NIA), 93.865 (NICHD), 93.173 (NIDCD), 93.371 (NCRR), 93.879 (NLM) and 12.300 (ONR). Awards are made under authorization of the Public Health Service Act, Title IV, Part A (Public Law 78-410, as amended by Public Law 99-158, 42 USC 241 and 285) and administered under PHS grants policies and Federal regulations 42 CFR 52 and 45 CFR part 74. Applications submitted in response to this announcement are not subject to the intergovernmental review requirements of Executive Order 12372 as implemented through Department of Health and Human Services regulations at 45 CFR part 100 or Health Systems Agency Review.